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OCCUPATIONAL TRENDS IN THE CIVILIAN AND NAVY LABOR MARKETS

by

Mike A. Haumer

December 1991

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OCCUPATIONAL TRENDS IN THE CIVILIAN AND NAVY LABOR MARKETS

by

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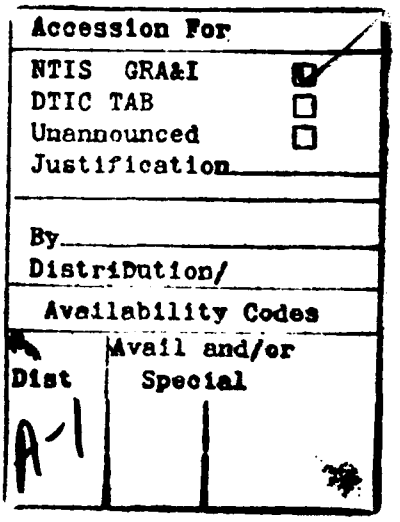
ABSTRACT

This thesis compares occupational trends in the civilian and Navy Labor Markets. This is accomplished by matching civilian occupations to Navy ratings with similar job characteristics. The matched occupations are categorized according to technical level and skill level. These categories are used to compare trends in occupational participation and earnings. The results of the analysis support the conclusion that competition for highly technical and skilled workers between the Navy and civilian work force is increasing. It is recommended that the Navy continue to emphasize highly technical and skilled occupations when allocating reenlistment bonuses. It is also recommended that further research be conducted on the inclusion of occupational variables in regression models that predict reenlistment rates.



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I. INTRODUCTION

A. BACKGROUND

The United States finds itself in the midst of turbulent times for the military. Major budget cuts and force reductions have begun and are planned to continue. Record budget deficits in the 1980s have led to forced reductions in defense expenditures. The Gramm-Rudman-Hollings Amendments of 1985 and 1987 initially and, most recently, the Budget Enforcement Act of 1990 have placed restrictions on our nation's discretionary spending.(Schick, 1990) Real defense spending will decline through 1993 and probably face further cuts in 1994 and 1995.(Hoagland, 1990) Furthermore, these reductions have been legitimized by the breakup of the Warsaw Pact and political upheaval in the Soviet Union. Many public officials view these political changes as a significant reduction in the military threat faced by the United States. This has led to demands for further reductions in defense spending to collect the "peace dividend."

Current Navy plans call for a 450-ship Navy by 1995 with a simultaneous active duty manpower reduction of approximately 20 percent.(Hale, 1991, Total Force Policy Study Group, 1990) More recently, General Colin Powell, Chairman of the Joint Chiefs of Staff, has indicated that further cuts to 414 ships

might be made by 1997.(Sinaiko, 1991) The reduction in manpower implies that recruiting needs will decline as well as the need for currently high rates of personnel retention. Furthermore, the sluggish civilian economy should make the military more attractive. Reduced requirements along with the sluggish economy have already drawn attention to military compensation policies as sources of further savings in the defense budget. One of the policies likely to be investigated is the Navy's Selective Reenlistment Bonus (SRB) program. The Navy has allotted $165 million in SRB payments in fiscal 1991 and expects to pay $148 million in fiscal 1992.(Burlage, 1991)

Although force cuts are an accepted fact, the U.S. political and military leadership is committed to maintaining a highly ready and technologically superior force. The Navy must, therefore, continue to recruit and retain high quality, technically superior sailors. There are several factors that are reducing the availability of these individuals. The first factor is the decreasing number of 18-to 21-year-olds in the general population. The end of the "baby boom" has left the nation with a declining youth population through 1995.(Binkin, 1986) Another factor reducing the availability of high quality youth is a decline in the educational system. Many reports have documented the decline in science and math skills possessed by American youth.(Binkin, 1986) Lastly, as the growth in industrial technology accelerates, civilian

employers have become increasingly more competitive for high-quality youth.

It is not the intent of this thesis to determine where or how defense expenditures should be cut. The goal of this thesis is to begin to explore the relationship between civilian and Navy labor markets. A better understanding of the trends in civilian compensation and the composition of the civilian labor force will allow the Navy to be more aware of the potential consequences of current and future expenditure cuts.

B. LITERATURE REVIEW

1. GENERAL INFORMATION

There is a limited amount of previous research comparing the civilian labor force with that of the Navy. The research ranges from investigating trends in military occupations alone (Eitelberg, 1988) to a determination of the importance of civilian job growth to Navy reenlistment patterns (Quester and Thomason, 1984). Other studies include an analysis of the adequacy of military compensation (SAG Corporation, 1988), an investigation of geographic variations in recruiting market conditions (Kostiuk, 1989), and a study of the effect of pay and retention bonuses on quit rates in the U.S. Army (Lakhani, 1988). Although the objectives of these studies were not the same as that of this thesis, the information presented and the processes used have been helpful.

Previous literature has pointed out the need for this study. The SAG Corporation report compared the different data sources that could be used to compare military and civilian pay. The Employment Cost Index (ECI) is currently used by the Department of Defense (DOD) to examine changes in overall civilian wages. The SAG Corporation researchers compared civilian wage information in the ECI to the information available in the Current Population Survey (CPS) and the Professional, Administrative, Technical and Clerical Survey (PATC). The study concluded that the CPS and PATC offered no significant advantages over the ECI (SAG Corporation, 1988). The ECI does not, however, take the age and education distributions of the work force into account, factors that have been shown to have a significant effect on wage comparisons. From 1976 to 1987, the real earnings of men, ages 18 to 25, dropped approximately 15 percent. Furthermore, when the 18 to 25 year-old category was restricted to high school graduates, earnings dropped 19 percent. During the same period, the real earnings of men between the ages of 26 and 50 fell only 4.8 percent. (Kostiuk, 1989) Since the military is younger and has a higher percentage of high school graduates than the civilian labor force, these factors should not be ignored in comparisons between the two markets.

The most important items gained from the previous literature have been used to develop the methodology for this study. Matching civilian occupations to military specialties

and defining major occupational categories were the major inputs from the literature.

2. OCCUPATIONAL MATCHING

Quester and Thomason (1984) found that the reenlistment rates of specific Navy ratings are affected by employment growth in the civilian occupations that most closely correspond to military specialties. This was an important step in linking the civilian economy to the career military.

The first step in Quester and Thomason's process of linking the civilian and Navy labor markets was to match Navy specialties with civilian occupations. Technically, such a match is called a "crosswalk." No reliable crosswalk existed at the time, so Quester and Thomason built their own. They managed to match 100 Navy ratings with Bureau of Labor Statistics (BLS) civilian occupational codes. The "matched" Navy ratings were then divided into two classifications: "highly technical" and "less technical." (Quester and Thomason, 1984) A weighted least-squares regression model was developed to estimate the effect of differences in employment growth by civilian occupation on reenlistment rates in the associated Navy rating. The results showed that, for the second reenlistment decision, reenlistment rates in the "highly technical" ratings were very sensitive to civilian job growth. A two-percent decline in reenlistment rates was

observed for every one percent of civilian occupational growth. This study illustrated that the Navy's labor market was closely linked to the civilian labor market.

Lakhani (1988) investigated the effect of Selective Reenlistment Bonuses (SRBs) and Military pay on quit rates in the U.S. Army. He categorized all Army specialties as either combat or noncombat positions. His next step was to match civilian occupations to these military categories. Instead of matching individual civilian and military occupations, Lakhani simply matched general military occupational categories from the Integrated Defense Occupation Codes with general civilian categories from the 1970 Census Occupation Codes. For example, combat personnel were identified with the "Operatives" civilian category.

Lakhani's hypothesis was based on human capital theory. He hypothesized "that soldiers in combat occupations acquire the equivalent of firm-specific training during their Army service, whereas soldiers in noncombat occupations are trained in general skills that are more readily transferable to the civilian sector." (Lakhani, 1988) Therefore, combat soldiers should respond more readily than those in noncombat occupations to the monetary reenlistment incentives offered by the Army.

A three-stage least squares estimation was performed to measure the differences caused by civilian wages. Lakhani found that quit rates of combat occupations were more

responsive than noncombat occupations to changes in SRB levels. This supports his claim that the skills obtained by combat personnel are not as readily transferred as the skills of noncombat personnel. Furthermore, Lakhani found that, for both occupational groups, a one-percent increase in the civilian wage caused SRB levels to increase by approximately 1.8 percent. This showed that both occupational groups were equally responsive to wage changes in the civilian labor market.

3. OCCUPATIONAL CATEGORIES

Quester and Thomason's occupational categories of "highly technical" and "less technical" were developed by a "panel of experts," including two Naval Officers. Unfortunately, the report did not present a detailed list of the occupations included in each category.

In 1988, Eitelberg published a comprehensive monograph on "Manpower for Military Occupations." The study documents the sweeping changes in the occupational composition of the American military from the early 1800s through 1987. During the American Civil War, 93.2 percent of the military was composed of individuals in general military skills and combat categories. By 1960, this number had fallen to less than 19 percent, while clerical workers, craftsmen, and technical workers had increased dramatically. The composition of the military has seen only relatively minor changes since 1960--

an increase in technical workers and corresponding decreases in craftsmen and persons in the general skills. (Eitelberg, 1988)

Eitelberg used several occupational classification systems in his historical comparisons of military manpower. Technical level and skill level were the basis for two of these classification schemes. These two classification systems are of primary interest to this thesis.

All military specialties were categorized according to skill level. The three categories that were developed are: skilled (the highest skill level), semi-skilled, and unskilled (the lowest level). The military specialties included in each category were also listed. All Navy specialties were also divided into three groups based on technical level: highly technical, technical, and semi-technical. Since the categories used in this thesis are based on the categories used by Eitelberg, a detailed list of the technical occupational categories and the military specialties they contain is included in Appendix A.

C. OBJECTIVE

The objective of this thesis is to investigate trends in the civilian labor market and their effects on the Navy's labor market. This is accomplished by analyzing trends in civilian earnings and trends in the types of occupations in

which civilians are employed. Comparisons are made to Navy compensation and occupational composition.

The analysis is based on matching civilian occupational classifications to Navy occupations or "ratings." This job matching is accomplished using an "occupational crosswalk" constructed by the Center for Naval Analyses. (Quester et al., 1985) The occupational crosswalk determines civilian and military occupations that are comparable in terms of training, skill, and responsibility levels. The occupations are then split into broad categories for analysis. The categories revolve around two broad themes: technical level and skill level. (Eitelberg 1988) Average earnings and the distribution of jobs by occupational category are determined using data from the Current Population Survey (CPS).

D. SCOPE, LIMITATIONS, AND ASSUMPTIONS

The analysis of civilian occupations is limited to those occupations that are similar to Navy occupations. Likewise, only Navy occupations that have reasonable civilian counterparts are considered. This includes 42 Navy ratings and 54 civilian occupations. Since some Navy ratings and civilian occupations are excluded, the potential for bias exists if the omitted occupations are not evenly distributed among the major occupational classifications. For example, suppose that a greater proportion of the omitted civilian occupations should be considered highly technical. This would

cause the highly-technical classification to show a smaller than actual percentage of the total civilian work force.

The analysis assumes that the occupational crosswalk is accurate--that is, that the occupational matches give an accurate representation of the variances between job types. Another assumption is that sufficient variance exists between the civilian occupational codes used (1980 census codes) to make meaningful inferences about the technical and skill levels of these jobs.

E. ORGANIZATION OF THE STUDY

Chapter II describes the data and methodology used in the study.

Chapter III contains the results of the study. Included are the trends in occupational and earnings growth.

Chapter IV presents conclusions that are derived from the comparison of the civilian and Navy labor markets. Recommendations, as a result of the study, are also included.

II. DATA AND METHODOLOGY

A. DATA

1. The Civilian Samples

The civilian samples used in this study were developed using data from the Current Population Survey (CPS). The CPS is the source of official Government statistics on monthly employment and unemployment. The CPS, which has been conducted for over 40 years, currently interviews approximately 57,000 households monthly. The households are scientifically selected on the basis of area of residence to represent the nation as a whole. The CPS provides data on employment status, occupation, industry, and other subjects. Demographic variables such as age, race, sex, and marital status are also included. Information on each member of the household is collected. The resulting file size is roughly 163,000 records per month.

Current Population Surveys from March of 1980, 1985, and 1990 were used in this study. The March surveys were selected because they include supplementary data on income and labor force participation.

One problem with these data files is that the occupational classification system used in the CPS was changed in 1983. Beginning in 1983 the occupational classification

system used in the 1980 census was introduced in the CPS. For the ten years prior to 1983, the CPS used an occupational classification system from the 1970 census. The two occupational classification systems are different "in concepts and nomenclature," according to the Bureau of Labor Statistics. (1988) Therefore, adjustments had to be made in this thesis so that occupational trends from 1980 to 1985 and 1990 could be compared. These adjustments are described below in the methodology section of this chapter.

2. The Navy Samples

Data for generating the Navy samples of enlisted personnel were obtained from the Defense Manpower Data Center (DMDC) in Monterey, CA. Data files containing information for all members of the Navy and Marine Corps were available for 1980 and 1990. Marines and officers were deleted for this thesis since only Navy enlisted data were of concern. The resulting files contain individual-level data on all Navy enlistees who were on active duty at the end of the two fiscal years, 1980 and 1990. The data include demographic information such as age, race, and sex. Most important to this thesis, though, are the occupational specialty codes. The files include Department of Defense Occupation Codes (DODOCs) and Navy rating codes.

B. METHODOLOGY

1. Restrictions on the Civilian Samples

The civilian samples were limited to represent that part of the civilian population with demographic characteristics similar to the Navy's enlisted force. Limiting the civilian samples allows later comparisons to focus on the portion of the civilian labor market that competes with the Navy for manpower.

Men accounted for 93.5 percent of the Navy enlisted force in 1980 and 90.2 percent in 1990. In contrast, men make up less than 60 percent of the civilian work force. Women were deleted from the civilian samples because they make up such a small percentage of the Navy's enlisted force (approximately 10 percent).

The educational distribution of the civilian work force is also significantly different from that of the Navy's enlisted force. The Navy has a much higher percentage of high school graduates and a much lower percentage of college graduates than does the civilian work force. In 1990, 93.1 percent of all Navy enlisted personnel had a high school diploma but no four-year college degree. The proportion of civilian workers in this category is much lower (approximately 60 percent). To ensure an education distribution similar to that of the Navy, the civilian samples were limited to

individuals who possessed a high school diploma but no four-year college degree.

The age distribution of the civilian labor force is also significantly different from that of the Navy. This study focuses on first-and second-term Navy reenlistments. The majority of these individuals are between 18 and 30 years old, representing over 75 percent of the Navy's enlisted personnel. In comparison, only 35 percent of the civilian labor force is in this age group. Therefore, the civilian sample was limited to workers between the ages of 18 and 30.

The civilian samples were further restricted to full-time, full-year workers. These are the jobs that most Navy veterans seek upon leaving the Navy. Also, limiting the civilian samples to these individuals minimized the effect of "outliers" on the average sample earnings. The final sample populations contain workers who were employed for a minimum of 50 weeks during the past year and who averaged at least 35 hours of work per week.

Appendix B.1 summarizes these demographic distributions for the Navy in 1980 and 1990. Appendix B.2 lists the demographic and employment distributions for the civilian work force in the March CPS surveys for 1980, 1985, and 1990.

2. Matching Civilian Occupations to Navy Ratings

An occupational "crosswalk" was used to match individual civilian occupations to specific Navy ratings. This type of matching was used to capture as much of the individuality between occupations as possible. Simply comparing broad civilian categories to Navy categories, as Lakhani did, would have introduced more error into the matching process. (Lakhani, 1988) For example, Lakhani matched combat troops with civilian operatives. Included in the operative category are dressmakers, seamstresses, meat cutters, and butchers (Bureau of Labor Statistics, 1981). Although these occupations may match combat occupations in terms of training and educational requirements (which was Lakhani's main focus), these jobs are probably not representative of the jobs that combat veterans would take after leaving the military. By matching individual occupations on the basis of training, skill level, and the type of work performed, the civilian sample becomes a direct representation of the types of jobs that veterans would take after leaving the military. The resulting, matched civilian occupations can be thought of as the civilian labor market that is in direct competition with the Navy for workers.

The occupational crosswalk used in this study was developed for the Department of Defense (DOD) by the Center for Naval Analyses (CNA) in 1985. The crosswalk was developed

as part of the National Manpower Inventory study. The inventory was to identify the civilian manpower available in militarily-relevant occupations.

The first step in conducting the inventory was to link civilian occupations to military occupations. At the time, no crosswalk existed that linked military job codes (ratings and Navy Enlistment Codes (NECs)) to civilian census occupation codes. The CNA researchers used a previous crosswalk to link military job codes to those in the civilian Dictionary of Occupational Titles (DOT). The DOT codes were then linked to Standard Occupational Classification (SOC) codes and census codes using a separate crosswalk. During each step of the process, some occupations were "lost" due to incompatibility of the terms of the different classification systems. The resulting crosswalk matched a little over half (259 of 503) of the census occupation codes to military occupation codes.

Several technical difficulties were identified with the military occupation/census code matches. In some cases, several civilian jobs matched with a single military occupation and vice-versa. This can result in a loss of job identity in the civilian or military occupation. A second problem is that the list of military occupations without civilian counterparts is not wholly credible. Also, the methodology misses some militarily-relevant civilian jobs. An example of this is civilian Electronics Technicians, which obviously should match several military occupations. As a

result of the methodology used, however, civilian Electronics Technicians did not match any military occupation. In this case, Electronics Technicians were added by the researchers after the fact. (Quester et al., 1985)

The DOD crosswalk matched civilian occupations to military occupations from the Army, Navy, Marine Corps, and Air Force. Since only the Navy matches were of concern, the other Services were deleted from the file. Furthermore, it was desired to only match Navy ratings to civilian occupations. Matching individual NECs to civilian occupations was beyond the scope of this thesis. This process resulted in 54 Navy ratings matched with 67 civilian occupations (1980 census codes). Appendix C.1 lists the 1980 census occupation codes that had Navy matches, and Appendix D lists the Navy ratings that were matched.

Since the 1980 CPS file used 1970 census occupation codes, these codes had to be manually matched to the 1980 census codes used in the crosswalk and the 1985 and 1990 CPS files. Thirteen of the 1980 census occupations could not be matched to 1970 census codes. These 13 occupations were deleted from the 1985 and 1990 samples to maintain the same occupations for each sample year. By deleting these 13 civilian occupations, their Navy counterparts were also deleted. Furthermore, only Navy ratings that were in existence in both 1980 and 1990 were included.

This process resulted in a group of 42 Navy ratings (Appendix A) with the same occupational characteristics as a group of 54 civilian occupations using 1980 census codes (Appendix C, Table C.1), and 55 civilian occupations using 1970 census codes (Table C.2). These matched Navy and civilian occupations represent approximately 41 percent of the Navy's enlisted personnel and 30 percent of the civilian work force. These matched occupations are the basis for the remainder of the study.

3. Categorizing Occupations

a. Technical Level

The 42 matched Navy ratings were categorized by technical level based on a classification system from Eitelberg (1988). Eitelberg lists the specific ratings that fall in the highly technical (highest) and semi-technical (lowest) categories. (See Appendix A) The remaining ratings were placed in the technical (middle) category. Since Navy ratings change over time, using these categories to analyze trends can introduce errors. Out-of-date ratings are deleted and new ratings are added. Since only Navy ratings that were present in 1980 and 1990 were used in this sample, this problem does not affect this study. Appendix A lists the sample Navy ratings by technical level.

The civilian occupations were categorized according to their corresponding Navy rating. Nine of the 54 civilian

codes matched with Navy ratings in more than one occupational category. These occupations represented a significant portion of the total sample and could not be deleted without a detrimental reduction in the sample size. These nine occupations were allocated according to the category into which the majority of the corresponding Navy ratings fell. Table C.3 lists these "marginal" civilian occupations and the choices that were made. Table C.1 indicates the technical level assigned to each of the 54 civilian occupations included in the sample.

b. Skill Level

The matched Navy ratings were classified by skill level according to a classification scheme used by Eitelberg (1988). Eitelberg categorizes occupations as skilled, semi-skilled, or unskilled, according to broad DOD specialty areas as shown in Table 1.

These broad specialty areas were converted to Navy Ratings using the DOD Occupational Conversion Manual. Appendix D, Tables D.2.A through D.2.C list the 42 matched Navy ratings by skill level.

The civilian occupations are categorized by skill level according to their corresponding Navy ratings. Once again, there were marginal civilian occupations that were assigned according to Table C.3. Table C.1 indicates the

skill levels assigned to each of the 54 civilian occupations included in the sample.

TABLE 1. THE DOD OCCUPATIONAL CATEGORIES BY SKILL LEVEL

Skilled

Electronic Equipment Repairers
Communications and Intelligence Specialists
Other Technical and Allied Specialists

Semi-Skilled

Medical and Dental Specialists
Functional Support and Administration
Electrical/Mechanical Equipment Repairers

Unskilled

Infantry, Gun Crews, and Seamanship Specialists
Craftsmen
Service and Supply Handlers

Source: Eitelberg (1988)

4. Determining Civilian Earnings

Civilian earnings information for the year prior to the survey is included in the March CPS. Unfortunately, only annual earnings are included in all three of the years investigated. Since annual earnings vary greatly with differences in the number of weeks and hours worked, weekly and hourly earnings were determined. Weekly earnings were determined by dividing annual earnings by the number of weeks worked. Hourly earnings were determined by dividing weekly

earnings by the average number of hours worked per week. This increases the number of individual responses necessary to determine earnings and, therefore, increases the potential number of errors. The effect of these errors was minimized by deleting outliers from the sample. For example, individuals with weekly earnings less than $160 or greater than $1000 in 1989 (earnings information from the March 1990 CPS) were deleted from the sample. These values were deflated by the Consumer Price Index (CPI) to determine cutoffs for 1984 and 1979 earnings. The hourly earnings cutoffs were simply the weekly cutoffs divided by 40 hours per week. Table 2 lists the weekly earnings cutoffs used in this study.

TABLE 2. WEEKLY EARNINGS CUTOFFS BY SAMPLE YEAR (IN DOLLARS)

Earnings Cutoff	1979	1984	1989
Minimum Weekly Earnings	93.68	134.06	160.00
Maximum Weekly Earnings	585.50	837.90	1000.00
Consumer Price Index (CPI)	72.6	103.9	124.0

Source: Bureau of Labor Statistics (1991)

III. RESULTS

A. COMPARISON OF TRENDS IN THE OCCUPATIONAL COMPOSITION OF THE NAVY AND CIVILIAN LABOR FORCES

The trends discussed below are based on the matched Navy and civilian samples described in the previous chapter. The objective of comparing the trends in the occupational composition of the Navy and civilian labor markets is to investigate the convergence hypothesis. If, in fact, the civilian and Navy labor markets are becoming more alike, the percentage of workers in each of the occupational categories for the Navy should be approaching the percentage of workers in the corresponding civilian categories.

1. Comparing Navy and Civilian Occupational Compositions by Technical Level

Table 3 presents the trends in the percentage distribution of Navy enlisted personnel and civilians by technical level in 1980 and 1990. The table shows that the percentage of highly technical and technical jobs in the Navy increased while the percentage of semi-technical (the least technical) jobs decreased. The 120 percent increase in the share of highly technical civilian jobs is misleading. This is partially a result of the fact that very few civilian jobs matched the highly technical Navy occupations. As a result, the highly technical category is composed largely of civilian

Electronics Technicians. Thus, the large increase in this category's share is explained mostly by the large increase in the percentage of Electronics Technicians from 1980 to 1990.

TABLE 3. PERCENTAGE DISTRIBUTION OF OCCUPATIONS BY TECHNICAL LEVEL: 1980 AND 1990

Technical Category	1980	1990	Percentage Change
Navy Sample			
Highly Technical	23.4	24.7	+5.6
Technical	47.2	49.0	+3.8
Semi-Technical	29.4	26.3	-10.5
Total	100.0	100.0	---
Civilian Sample			
Highly Technical	3.0	6.6	+120.0
Technical	84.2	80.9	-4.0
Semi-Technical	12.8	12.5	-2.5
Total	100.0	100.0	---

Source: Derived from data provided DMDC and the CPS.

Since all of the highly-technical Navy ratings deal heavily with electronics, the large increase in civilian Electronics Technicians is important. This increase shows that the highly technical portion of the civilian labor market is converging with the Navy's highly-technical category. Another cause for the large increase in the percentage of highly-technical occupations may be the change in the occupational classification system used by the CPS. Since the

same occupational classification system was used in 1985 and 1990, the trends between these years are more reliable. Appendix E (Table E.2) shows that highly-technical civilian occupations only increased their share by 5.2 percent between 1985 and 1990. This provides evidence that the 120 percent increase in the share of highly-technical occupations between 1980 and 1990 is being caused partially by the different classification systems in use.

The minor changes in the other civilian categories do not provide enough evidence for further conclusions. Appendix D presents the detailed results of the occupational analysis of the Navy. The results include the actual number of personnel in each rating and the percentage share of each occupational category. Tables D.1.A through D.1.C list the results by technical level. Appendix E contains the results of the trends in civilian occupational participation. Table E.1 presents the number of civilians in each technical category including 1985 data. Table E.2 shows the percentage changes in each occupational category from 1980 to 1985, 1985 to 1990, and 1980 to 1990.

2. Comparing Navy and Civilian Occupational Compositions by Skill Level

Table 4 shows the percentage distributions of Navy enlisted personnel and civilians by occupational skill level in 1980 and 1990. Although the direction of change is the same for the Navy and the civilian labor force, these data do

not support the convergence hypothesis. The Navy continues to have a much higher percentage of its work force in skilled occupations and a lower percentage in unskilled jobs than does the civilian sector.

TABLE 4. PERCENTAGE DISTRIBUTION OF OCCUPATIONS BY SKILL LEVEL: 1980 and 1990

Technical Category	1980	1990	Percentage Change
Navy Sample			
Skilled	31.0	30.8	-0.6
Semi-Skilled	40.2	42.7	+6.2
Unskilled	28.8	26.5	-8.0
Total	100.0	100.0	---
Civilian Sample			
Skilled	15.9	15.8	-0.6
Semi-Skilled	36.9	40.2	+8.9
Unskilled	47.2	44.0	-6.8
Total	100.0	100.0	---

Source: Derived from data provided by DMDC and the CPS.

The share of skilled occupations in both the Navy and the civilian work force was essentially unchanged between 1980 and 1990--showing no sign of convergence in this category. Likewise, the 6.8 percent decline in the share of civilian, unskilled occupations did not keep pace with the 8.0 percent decrease in the share of unskilled jobs in the Navy. The fact

that the Navy started with a smaller percentage of unskilled jobs, and that the percentage of unskilled jobs in the Navy is declining faster than in the civilian work force, indicates divergence instead of convergence between the Navy and civilian labor markets for unskilled jobs. The semi-skilled category, conversely, does show convergence. Since the civilian work force has a smaller percentage of semi-skilled occupations, and the percentage of these occupations is increasing faster in the civilian labor market, semi-skilled occupations seem to be converging.

The results of the occupational analysis are inconclusive. The convergence hypothesis is supported in some occupational categories while in other categories it is not. Tables D.2.A through D.2.C present the detailed results of the Navy's occupational distributions by skill level. The distribution of civilian occupations by skill level is shown in Tables E.1 and E.2.

B. THE RELATIONSHIP BETWEEN CIVILIAN OCCUPATIONAL EARNINGS AND NAVY MANPOWER

The following section presents the trends in civilian occupational earnings between 1980 and 1990. The 1985 data are included in Appendix F. Also included in this section are the trends in Navy Selective Reenlistment Bonuses (SRBs) and reenlistment rates by Navy occupational category. Average SRB levels for individual Navy ratings are presented in Appendix

G. A comparison of the civilian trends and Navy trends can lead to a better understanding of the linkages between the civilian and Navy labor markets.

1. Civilian Occupational Earnings Trends

a. Weekly Earnings Trends

Table 5 presents the trends in weekly civilian earnings by technical and skill level for 1980 and 1990. The results are presented in nominal dollars. The table shows that earnings for highly technical occupations increased much more rapidly than for the other occupational categories. The increase in highly technical earnings was 15.5 percentage points higher than the increase for the total matched sample (the 54 matched civilian occupations): nominal earnings in the highly technical category grew 71.4 percent, whereas for the entire matched sample they grew only 55.9 percent. This suggests that civilian competition for these highly technical workers was increasing over the period.

Weekly earnings for skilled workers (shown in the second panel of Table 5) increased at a rate 4.4 percentage points higher than for the total matched sample. Although not as dramatic as the increase in highly technical earnings, this increase also suggests growing competition for these workers during the 1980s. Semi-technical earnings increased at a rate 4.5 percent lower than the total matched sample, which suggests reduced demand for occupations in this category.

Table 5 also provides evidence that the civilian samples used in this thesis are representative of that portion

TABLE 5. AVERAGE WEEKLY CIVILIAN OCCUPATIONAL EARNINGS (IN DOLLARS)

Occupational Category	1980	1990	Percent Change
Technical Level			
Highly Technical	286.89	491.87	+71.4
Technical	292.99	453.28	+54.7
Semi-Technical	278.15	435.95	+56.7
Skill Level			
Skilled	301.71	483.57	+60.3
Semi-Skilled	300.69	455.13	+51.4
Unskilled	278.97	441.59	+58.3
Total Matched Sample	290.91	453.66	+55.9
All Occupations	279.94	371.00	+56.5
Consumer Price Index (CPI)	72.6	124.0	+70.8

Source: Derived from data included in the March 1980 and 1990 CPS.

of the civilian work force that competes with the Navy for manpower. A comparison of the total sample earnings and the change in the Consumer Price Index (CPI) indicates a decline in real earnings of 13 percent for the civilian matched sample

set. This decline is comparable with results from previous studies (Kostiuk, 1989). Appendix F lists the results of the civilian earnings trends including results from the 1985 CPS.

TABLE 6. AVERAGE HOURLY CIVILIAN OCCUPATIONAL WAGES (IN DOLLARS)

Occupational Category	1980	1990	Percent Change
Technical Level			
Highly Technical	6.70	11.34	+69.3
Technical	6.82	10.46	+53.4
Semi-Technical	6.64	10.24	+54.2
Skill Level			
Skilled	6.97	11.16	+60.1
Semi-Skilled	7.02	10.60	+51.0
Unskilled	6.54	10.15	+55.2
Total Matched Sample	6.79	10.49	+54.4
All Occupations	6.47	10.07	+55.6
Consumer Price Index (CPI)	72.6	124.0	+70.8

Source: Derived from data included in the March 1980 and 1990 CPS.

Table F.1.B includes trends from 1980 to 1985, 1985 to 1990, and 1980 to 1990.

b. Hourly Wage Trends

The hourly wage trends are presented in Table 6. Table F.2.B includes the 1985 wage results. The table reveals that the trends in hourly wages mirror the trends in weekly earnings shown in Table 5.

Because of the methodology used, the differences between Table 5 and Table 6 reflect differences in the average number of hours worked in each occupational category. For example, the percentage increases in earnings for the total matched sample are lower hourly wages than for weekly earnings.

This shows that the average number of hours worked per week has increased for the sample. The largest increase in average number of hours worked per week occurred for unskilled occupations. This caused a difference of 3.1 percent between the increase in weekly earnings and the increase in hourly wages (58.3-55.2). The lower percentage change in the wages for unskilled occupations tends to highlight the percent change in wages for the skilled category. Looking at the percent change in hourly wages makes the increase in earnings of skilled workers more significant than for weekly earnings.

2. Navy SRB and Reenlistment Trends

Navy SRB and reenlistment trends are investigated in an attempt to determine the competitive relationship between

the civilian and Navy labor markets. SRBs were analyzed since this is the portion of Navy enlisted pay that is occupation-specific. SRBs are adjusted for individual Navy ratings to maintain the Navy's required force structure. If a specific rating has low retention and requirements are high, the SRB for that rating is increased. Since SRBs vary by Navy rating, changes in SRBs can be expected to reflect changes in civilian employment availability and earnings opportunities. Reenlistment rates are an indication of individuals' preferences for the Navy over civilian work. Reenlistment rates were analyzed by occupational category since they should also be affected by changes in the civilian labor market.

a. Navy Selective Reenlistment Bonuses

Table 7 lists Navy SRB multiples by occupational category and reenlistment zone for 1980 and 1990. The reenlistment zone indicates the length of service completed by the individual. Zone A is for individuals who have completed between one and six years of service. Zone B applies to individuals with six to ten years of completed service, and Zone C applies to individuals with more than ten years of service. SRB multiples are used to determine the amount of the reenlistment bonus. The bonus amount is determined by the product of the SRB multiple, the individual's monthly basic pay, and the length (in years) of the reenlistment. Thus, the SRB multiple is a measure of how large the bonus will be.

The average occupational SRB multiples shown in Table 7 were calculated from data received from PERS-20F (the Navy's Director of Enlisted Bonus Programs).

TABLE 7. AVERAGE NAVY SRB MULTIPLES BY OCCUPATIONAL CATEGORY AND ZONE: 1980 AND 1990

Occupational Category	1980			1990		
	Zone A	Zone B	Zone C	Zone A	Zone B	Zone C
Technical Level						
High-Tech	4.35	4.24	0.94	2.09	1.45	0.62
Technical	1.54	1.83	0.49	1.67	1.23	0.43
Semi-Tech	2.42	2.36	0.69	0.78	0.55	0.24
Skill Level						
Skilled	4.50	4.42	1.11	2.07	1.47	0.64
Semi-Skilled	1.60	1.91	0.52	1.82	1.38	0.49
Unskilled	1.46	1.42	0.34	0.48	0.24	0.07
Total Matched Sample	2.46	2.55	0.65	1.54	1.11	0.42

Source: Derived from data provided by DMDC and PERS-20F.

The total sample shows a marked decline for all zones from 1980 to 1990. The general decline in SRB levels reflects policy changes toward a more stable SRB program and cuts in the manpower budget. More ratings offered SRBs in

1990 than in 1980. Also, SRBs are not being changed as drastically from one period to the next. Recent policy changes have limited changes to one-half of one point from one SRB planning cycle to the next.

Most interesting to this thesis is that the highly technical and skilled categories offer higher SRB levels than the other occupational categories. This suggests that there is a connection between the higher civilian demand for these occupations and the "price" the Navy must pay to retain them.

b. Navy Reenlistment Rates

Table 8 shows average reenlistment rates by occupational category and reenlistment term for fiscal 1980 and 1990. Appendix H presents the average reenlistment rates for individual ratings. The "terms" indicate the enlistment after which the reenlistment applies. For example, first-term reenlistments indicate the percentage of personnel who reenlisted after their first enlistment out of all those eligible to reenlist. The average rates were computed from data received from PERS-20F.

In both 1980 and 1990, the highest first-term reenlistment rates occurred for highly-technical and skilled occupations. This is contrary to what would be expected given the strong civilian competition for these occupations. There are several explanations for the high first-term reenlistment

TABLE 8. AVERAGE NAVY REENLISTMENT RATES BY OCCUPATIONAL CAREGORY AND REENLISTMENT TERM: 1980 and 1990

Occupational Category	1980			1990		
	1st Term	2nd Term	3rd Term	1st Term	2nd Term	3rd Term
Technical Level						
High-Tech	48.9	50.7	87.4	58.2	68.4	90.0
Technical	31.5	56.9	86.4	49.8	70.4	93.6
Semi-Tech	28.4	65.9	92.7	49.1	79.5	94.4
Skill Level						
Skilled	43.7	54.3	88.0	56.4	68.4	90.5
Semi-Skilled	31.1	55.2	85.8	48.8	70.3	93.8
Unskilled	30.0	66.2	92.7	50.8	80.0	94.5
Total Navy	31.4	57.5	91.6	51.6	74.1	93.4
Total Matched Sample	34.7	58.1	88.5	51.7	72.3	93.0

Source: Derived from data received from DMDC and PERS-20F.

rates in the highly-technical and skilled categories. By investigating only two points in time, the samples are sensitive to fluctuations in the economy. For example, high civilian unemployment will cause reenlistment rates to be high. Another explanation is the high SRBs paid to highly-technical and skilled occupations along with the STAR reenlistment program. The STAR program offers individuals in

designated ratings the opportunity to reenlist with a bonus and automatic promotion from third-class petty officer to second-class petty officer. Almost all of the ratings that are eligible for the STAR program are in the highly-technical and skilled categories. Investigation of second-term reenlistment rates supports this claim. Table 8 shows that the second-term reenlistment rates for the highly-technical and skilled categories are lower than the other categories. A possible cause for this is that there is no STAR program available for second-term reenlistees and the civilian demand for these individuals is now being felt.

The percentage changes in first-term reenlistment rates reflect the trends in civilian earnings. Table 9 presents the percentage changes in first-term reenlistment rates by occupational category. The percentage increases in highly-technical and skilled reenlistment rates are significantly lower than in the other occupational categories. This reflects the civilian earnings trends in these categories. Since civilian earnings have increased faster in highly-technical and skilled occupations, Navy reenlistment rates have increased slower in these occupations. This reasserts the claim that competition between the Navy and civilian labor markets for highly-technical and skilled workers is increasing.

TABLE 9. PERCENTAGE CHANGE IN FIRST-TERM REENLISTMENT RATES BY OCCUPATIONAL CATEGORY: 1980 TO 1990

Occupational Category	Percentage Change in First-term Reenlistment Rate
Technical Level	
High-Tech	19.0
Technical	58.1
Semi-Tech	72.9
Skill Level	
Skilled	29.1
Semi-Skilled	56.9
Unskilled	69.3
Total Navy	64.3
Total Matched Sample	49.0

Source: Derived from data received from DMDC and PERS-20F.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

It is apparent that civilian and Navy occupations can be matched to form comparable occupational samples. Furthermore, by comparing occupational trends within these samples, it is possible to increase our understanding of the relationships between the Navy and civilian labor forces.

The analysis of trends in occupational distributions shows that the proportion of technical occupations in both the Navy and civilian labor markets is increasing. The Navy sample had a 5.6 percent increase in highly-technical occupations from 1980 to 1990. Highly-technical occupations increased even faster in the civilian work force.

The analysis of civilian occupational earnings trends shows that weekly earnings and hourly wages for highly-technical and skilled occupations are increasing at a faster rate than for other occupational categories. The analysis of Navy SRB levels and reenlistment rates shows that higher SRBs are paid to highly-technical and skilled individuals in order to retain them. This trend in SRB levels appears to have been a rational response to the increasing civilian competition for individuals with the highest skill and training levels. Thus, the competition between the Navy and civilian labor force

appears to be increasing for highly-technical and skilled personnel.

The methodology used in this thesis can be useful in linking the Navy and civilian labor force. Dividing Navy occupations by technical or skill level and comparing them to similar civilian occupations can lead to a deeper understanding of these linkages.

B. RECOMMENDATIONS

The results of this thesis lead to several recommendations. These recommendations address Navy policies to which this thesis is applicable. Also included are recommendations to improve the results of this thesis, making it more useful in Navy manpower decision-makers.

The first recommendation is that the Navy should continue to emphasize highly-technical and skilled occupations when allocating its SRB budgets. Retention of personnel in these categories is currently high, but civilian competition for them is increasing. Moreover, the increasing sophistication of new ships and weapons systems will likely increase the Navy's future requirements for technically-trained personnel.

A related recommendation is that SRBs (or other targeted pay) should be stressed over general pay increases. As competition for technically-trained Navy personnel increases, and the requirements for these sailors grows, retention may become problematic. Since recruitment has been reduced, the

future Navy will likely move toward a force structure composed largely of careerists. These trends suggest that the Navy's SRB budget may need to grow, rather than shrink, in future years.

The second recommendation is that civilian occupational and earnings growth should be investigated for inclusion in models that forecast reenlistment and retention rates, such as the Annualized Cost of Leaving (ACOL) model. These models currently use aggregate civilian variables such as the overall unemployment rate and average earnings for male civilians. Inclusion of occupational variables should improve the accuracy of these models by taking occupation-specific earnings and employment trends into account.

Finally, further research is required in this area. Although this thesis points out several interesting relationships between the civilian and Navy labor markets, the trends need to be investigated more thoroughly. More accurate trends can be determined by collecting data for successive years instead of five-or ten-year intervals. Also, to ensure more accurate trends, only CPS files that use the 1980 Census occupational codes should be used. This will ensure homogeneity between the sample occupational codes and the crosswalk occupational codes.

Further research should also focus on matching <u>all</u> Navy ratings with civilian occupations. Although the matched samples used in this thesis show interesting trends, they are

only of limited use to Navy manpower planners. It should be possible to match more Navy ratings with civilian occupations. This may be accomplished by tracking the types of civilian jobs individuals take after leaving the Navy. By matching these civilian jobs to the rating that the individual was in, many more of the ratings should be matched.

Another area requiring further investigation is the effect of occupation-specific unemployment rates. It is obvious that civilian unemployment conditions affect an individual's decision to reenlist. Current models use national or regional unemployment rates across all occupations and industries to help predict reenlistment rates. It should be possible to use the methodology of this thesis to determine unemployment rates for specific occupational categories. Unfortunately, the sample size of the individual monthly CPS is probably not sufficient for determining accurate occupational unemployment rates. To determine accurate occupational unemployment rates, several monthly CPS samples would have to be pooled to enlarge the sample size. These pooled samples can also be used to develop more accurate occupational growth and earnings trends.

When using occupational growth, earnings, and unemployment in regression models to predict reenlistment rates, various forms of the independent variables should be investigated. Specifically, lagged forms of these variables should be studied. This would be necessary, since current information on these variables are not be usually accessible to

individuals making reenlistment decisions. These individuals are more likely to base their decisions on occupational trends from a previous period, such as last month or last year.

APPENDIX A. NAVY RATINGS BY TECHNICAL CATEGORY

TABLE A.1. HIGHLY TECHNICAL NAVY RATINGS

Air Traffic Controller (AC)
*Aviation Electronics Technician (AT)
Aviation Electrician's Mate (AE)
*Aviation Fire Control Technician (AQ)
Aviation Antisubmarine Warfare Technician (AX)
Cryptologic Technician Maintenance (CIM)
Cryptologic Technician Interpretive (CTI)
Cryptologic Technician Technical (CTT)
*Data Systems Technician (DS)
Electronics Warfare Technician (EW)
*Electronics Technician (ET)
Fire Control Technician (Missiles) (FTM)
*Fire Control Technician (Guns) (FTG)
*Fire Control Technician (Ballistic Missile) (FTB)
*Missile Technician (MT)
*Sonar Technician (Surface) (STG)
*Sonar Technician (Submarine) (STS)
Training Devicemen (TD)

Source: Eitelberg, 1988

*Indicates these occupations were used in the matched sample developed in this thesis.

TABLE A.2. TECHNICAL NAVY RATINGS[1]

Aircraft Maintenance, Master Chief (AF)
Aviation Support Equipment Technician (AS)
Aviation Support Equipment Technician (Mechanical) (ASM)
Aviation Machinist's Mate (AD)
Aviation Support Equipment Technician (Electrical) (ASE)
Aviation Structural Mechanic (Safety Equipment) (AME)
Avionics Technician, Master Chief (AV)
Builder (BU)
Construction Mechanic (CM)
Construction Electrician (CE)
Electrician's Mate (EM)
Engineman (EN)
Equipment Operator (EO)
Gunner's Mate (Missiles) (GMM)
Gunner's Mate, Technician (GMT)
Gunner's Mate (Guns) (GMG)
Instrumentman (IM)
Interior Communication's Electrician (IC)
Machinist's Mate (MM)
Mineman (MN)
Ocean Systems Technician, Maintainer (OTM)
Ocean Systems Technician, Analyst (OTA)
Ocean Systems Technician (OT)
Steelworker (SW)
Torpedoman's Mate (TM)
Utilitiesman (UT)

Source: Eitelberg, 1988

[1]All of the Navy ratings that are not included in the highly-technical and semi-technical categories are included in this category. For brevity, only the ratings that were used in the matched sample developed in this thesis are included.

TABLE A.3. SEMI-TECHNICAL NAVY RATINGS

Aviation Boatswain's Mate (Aircraft Handling) (ABH)
Aviation Boatswain's Mate (AB)
Aviation Storekeeper (AK)
Aviation Boatswain's Mate (Fuels) (ABF)
*Aviation Boatswain's Mate (Launching and Recovery Equipment) (ABE)
*Boatswain's Mate (BM)
*Boiler Technician (BT)
*Hull Maintenance Technician (HT)
*Lithographer (LI)
*Mess Management Specialist (MS)
Personnelman (PN)
Postal Clerk (PC)
Religious Program Specialist (RP)
*Ship's Serviceman (SH)
Signalman (SM)
Storekeeper (SK)
Yeoman (YN)

Source: Eitelberg, 1988

*Indicates these occupations were used in the matched sample developed in this thesis.

APPENDIX B. SAMPLE DEMOGRAPHIC DISTRIBUTIONS

TABLE B.1. NAVY ENLISTED FORCE DEMOGRAPHIC DISTRIBUTIONS FOR 1980 and 1990 (IN PERCENT)

	1980	1990
Sex		
Male	93.5	90.2
Female	6.5	9.8
Age		
18-30	79.4	75.1
over 30	19.5	24.6
Education		
Not a H.S. Graduate	12.6	5.0
H.S. Graduate/Not a College Graduate	86.4	93.1
College Graduate	1.0	1.9
Pay-grade		
E1-E3	37.6	31.5
E4-E6	53.5	58.5
E7-E9	8.9	10.0

Source: Derived from data provided by DMDC.

TABLE B.2. CIVILIAN LABOR FORCE DEMOGRAPHIC DISTRIBUTIONS FOR 1980, 1985, AND 1990 (IN PERCENT)

	1980	1985	1990
Sex			
Male	55.9	54.2	53.4
Female	44.1	45.8	46.6
Age			
18-30	36.1	34.1	30.7
over 30	58.9	62.5	66.6
Education			
Not a H.S. Graduate	20.2	15.8	15.9
H.S. Graduate/Not a College Graduate	59.4	60.6	64.1
College Graduate	20.4	23.6	20.0

Source: Derived from data contained in the March 1980, 1985, and 1990 CPS.

APPENDIX C. CIVILIAN OCCUPATIONS THAT MATCHED TO NAVY RATINGS

TABLE C.1. CIVILIAN OCCUPATIONS THAT MATCHED TO NAVY RATINGS: 1980 CENSUS CODES

1980 Census Code	Description	Tech[2] Level	Skill[3] Level
213	Electrical and Electronic Technicians	HT	S
503	Supervisors, mechanics and repairers	HT	S
505	Automobile mechanics	T	SS
507	Bus, Truck, and stationary engine mechanic	T	SS
514	Automobile body and related repairers	T	SS
515	Aircraft mechanics, exc. engine	T	SS
516	Heavy equipment mechanics	T	SS
518	Industrial machinery repairers	T	SS
519	Machinery maintenance occupations	T	SS
523	Electronic repairers, communications and industrial equipment	T	SS
527	Telephone line installers and repairers	T	SS
529	Telephone installers and repairers	T	SS

[2]Indicates the technical category the occupation is classified under. HT=highly technical, T=technical, ST=semi-technical.

[3]Indicates the skill level the occupation is classified under. S=skilled, SS=semi-skilled, US=unskilled.

1980 Census Code	Description	Tech. Level	Skill Level
533	Miscellaneous electrical and electronic equipment repairers	HT	SS
534	Heating, air conditioning, and refrigeration mechanics	T	US
535	Camera, watch, and musical instrument repairers	T	SS
538	Office machine repairers	T	SS
539	Mechanical controls and valve repairers	T	SS
547	Specified mechanics and repairers	HT	S
553	Supervisors; brickmasons, stonemasons, and tile setters	T	US
554	Supervisors; carpenters and related workers	T	US
555	Supervisors; electricians and power transmission installers	T	SS
557	Supervisors; plumbers, pipefitters, and steamfitters	ST	US
558	Supervisors, n.e.c.	T	S
563	Brickmasons and stonemasons	T	US
567	Carpenters	T	US
575	Electricians	T	SS
577	Electrical power installers and repairers	T	SS
579	Painters, construction and maintenance	T	US
585	Plumbers, pipefitters, and steamfitters	T	US
588	Concrete and terrazzo finishers	ST	US
597	Structural metal workers	T	S
598	Drillers, earth	T	US
599	Construction trades, n.e.c.	T	US
633	Supervisors, production occupations	T	S

1980 Census Code	Description	Tech. Level	Skill Level
637	Machinists	T	SS
643	Boilermakers	ST	SS
646	Lay-out workers	ST	US
653	Sheet metal workers	T	S
655	Miscellaneous precision metal workers	T	SS
666	Dressmakers	ST	US
675	Hand molders and shapers, except jewelers	T	US
676	Patternmakers, lay-out workers, and cutters	ST	US
678	Dental laboratory and medical appliance technicians	T	SS
686	Butchers and meatcutters	ST	US
689	Inspectors, testers, and graders	T	US
694	Water and sewage treatment plant operators	T	US
695	Power plant operators	T	SS
696	Stationary engineers	ST	SS
699	Miscellaneous plant and system operators	T	US
734	Printing machine operators	ST	SS
735	Photoengravers and lithographers	ST	SS
737	Miscellaneous printing machine operators	ST	SS
748	Laundering and dry cleaning machine operators	ST	US
773	Motion picture projectionists	T	SS
774	Photographic process machine operators	T	S
783	Welders and cutters	T	S
795	Miscellaneous hand working occupations	ST	US

1980 Census Code	Description	Tech. Level	Skill Level
796	Production inspectors, checkers, and examiners	T	SS
804	Truck drivers, heavy	T	US
828	Ship captains and mates, except fishing boats	ST	SS
829	Sailors and deckhands	T	US
833	Marine Engineers	T	SS
843	Supervisors, material moving equipment operators	ST	US
844	Operating engineers	T	US
849	Crane and tower operators	T	US
867	Helpers, extractive occupations	T	SS
869	Construction laborers	T	US
883	Freight, stock, and material handlers	ST	US

Source: Derived from data included in the 1985 DOD Occupational Crosswalk.

TABLE C.2. CIVILIAN OCCUPATIONS THAT MATCHED TO NAVY RATINGS: 1970 AND 1980 CENSUS CODES

1970 Census Code	1980 Census Code	Description (from 1980 Census Codes)	Tech. Level	Skill Level
153	213	Electrical and Electronic Technicians	HT	S
473	505	Automobile mechanics	T	SS
472	514	Automobile body and related repairers	T	SS
471	515	Aircraft mechanics, exc. engine	T	SS
481	516	Heavy equipment mechanics	T	SS
495	519	Machinery maintenance occupations	ST	SS
485	523	Electronic repairers, communications and industrial equipment	T	SS
554	527	Telephone line installers and repairers	T	SS
552	529	Telephone installers and repairers	T	SS
470	534	Heating, air conditioning, and refrigeration mechanics	T	US
484	538	Office machine repairers	T	SS
492	547	Specified mechanics and repairers	HT	S
441	558	Supervisors, n.e.c.	T	S
410	563	Brickmasons and stonemasons	T	US
415	567	Carpenters	T	US
430	575	Electricians	T	SS
433	577	Electrical power installers and repairers	T	SS

1970 Census Code	1980 Census Code	Description (from 1980 Census Codes)	Tech. Level	Skill Level
510	579	Painters, construction and maintenance	T	US
522	585	Plumbers, pipefitters, and steamfitters	T	US
560, 421	588	Concrete and terrazzo finishers	ST	US
550	597	Structural metal workers	T	S
614	598	Drillers, earth	T	US
461	637	Machinists	T	SS
404	643	Boilermakers	ST	SS
535	653	Sheet metal workers	T	S
650, 651, 652, 653	655	Miscellaneous precision metal workers	T	SS
613	666	Dressmakers	ST	US
503	675	Hand molders and shapers, except jewelers	T	US
514	676	Patternmakers, lay-out workers, and cutters	ST	US
426	678	Dental laboratory and medical appliance technicians	T	SS
631, 632	686	Butchers and meatcutters	ST	US
690	694	Water and sewage treatment plant operators	T	US
525	695	Power plant operators	T	SS
545	696	Stationary engineers	ST	SS
692	699	Miscellaneous plant and system operators	T	US
530	734	Printing machine operators	ST	SS

1970 Census Code	1980 Census Code	Description (from 1980 Census Codes)	Tech. Level	Skill Level
515	735	Photoengravers and lithographers	ST	SS
422, 423	737	Miscellaneous printing machine operators	ST	SS
630	748	Laundering and dry cleaning machine operators	ST	US
505	773	Motion picture projectionists	T	SS
645	774	Photographic process machine operators	T	S
680	783	Welders and cutters	T	S
575	795	Miscellaneous hand working occupations	ST	US
452	796	Production inspectors, checkers, and examiners	T	SS
715	804	Truck drivers, heavy	T	US
751	869	Construction laborers	T	US
753, 762	883	Freight, stock, and material handlers	ST	US

Source: Derived from data included in the 1985 DOD Occupational Crosswalk and 1970 Census Codes (Bureau of Labor Statistics, 1981)

TABLE C.3. CIVILIAN OCCUPATIONS THAT COULD HAVE BEEN PLACED IN MORE THAN ONE OCCUPATIONAL CATEGORY

1970 Census Code	1980 Census Code	Description (from 1980 Census Codes)	Tech. Level	Skill Level
471	515	Aircraft mechanics, exc. engine	**T**/ST	SS
485	523	Electronic repairers, communications and industrial equipment	HT/**T**	S/**SS**
492	547	Specified mechanics and repairers	HT	**S**/SS
441	558	Supervisors, n.e.c.	T	**S**/SS/US
522	585	Plumbers, pipefitters, and steamfitters	**T**/ST	US
560, 421	588	Concrete and terrazzo finishers	T/**ST**	US
535	653	Sheet metal workers	**T**/ST	US/**S**
545	696	Stationary engineers	ST	**SS**/US
452	796	Production inspectors, checkers, and examiners	ST/**T**	**SS**/US

Source: Derived from data included in the 1985 DOD Occupational Crosswalk and 1970 Census Codes (Bureau of Labor Statistics, 1981)

NOTE: This table indicates the choices made when occupational categories for a specific occupation were ambiguous. The selected categories are bold and underlined.

APPENDIX D. DETAILED TRENDS IN NAVY OCCUPATIONAL PARTICIPATION

TABLE D.1.A. OCCUPATIONAL PARTICIPATION FOR HIGHLY TECHNICAL RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
AQ	2,481	3,080
ET	16,547	19,343
DS	2,436	3,049
AT	9,821	11,084
MT	2,143	1,834
STG	4,588	5,999
STS	2,926	3,905
FTB	994	859
FTG	3,172	1,648
Highly Technical Personnel	45,108	50,801
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Highly Technical	23.4%	24.6%

Source: Derived from data provided by DMDC.

TABLE D.1.B. OCCUPATIONAL PARTICIPATION FOR TECHNICAL RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
AME	2,711	2,327
UT	1,338	1,268
EM	11,857	15,874
CE	1,221	1,515
IC	5,452	6,573
IM	396	657
AD	12,805	10,008
AF	289	314
CM	1,562	1,689
AS	568	2,748
ASE	511	0
ASM	820	0
EO	2,045	2,117
SW	1,040	973
BU	2,587	3,027
AV	207	347
OT	1,393	20
OTA	0	1,454
OTM	0	458
GMG	3,943	4,233
GMM	1,347	2,180
GMT	1,869	0
MN	540	632
TM	3,655	4,082
MM	24,566	30,248
EN	8,380	8,346
Technical Personnel	91,102	101,090
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Technical	47.2%	49.0%

Source: Derived from data provided by DMDC.

TABLE D.1.C. OCCUPATIONAL PARTICIPATION FOR SEMI-TECHNICAL RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
SH	4,954	4,704
HT	11,440	7,663
LI	428	553
ABE	1,865	2,495
BM	9,185	11,671
BT	11,961	9,412
MS	16,805	17,725
Semi-Technical Personnel	56,638	54,223
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Semi-Technical	29.4%	26.3%

Source: Derived from data provided by DMDC.

TABLE D.2.A. OCCUPATIONAL PARTICIPATION FOR SKILLED RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
AQ	2,481	3,080
AT	9,821	11,084
AV	207	347
BT	11,961	9,412
DS	2,436	3,049
ET	16,547	19,343
FTB	994	859
FTG	3,172	1,648
MT	2,143	1,834
OT	1,393	20
OTA	0	1,454
OTM	0	458
STG	4,588	5,999
STS	2,926	3,905
SW	1,040	973
Skilled Personnel	59,709	63,465
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Skilled	31.0%	30.8%

Source: Derived from data provided by DMDC.

TABLE D.2.B. OCCUPATIONAL PARTICIPATION FOR SEMI-SKILLED RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
ABE	1,865	2,495
AD	12,805	10,008
AF	289	314
AME	2,711	2,327
AS	568	2,748
ASE	511	0
ASM	820	0
CE	1,221	1,515
CM	1,562	1,689
EM	11,857	15,874
EN	8,380	8,346
IC	5,452	6,573
IM	396	657
LI	428	553
MM	24,566	30,248
MN	540	632
TM	3,655	4,082
Semi-Skilled Personnel	77,626	88,061
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Semi-Skilled	40.3%	42.7%

Source: Derived from data provided by DMDC.

TABLE D.2.C. OCCUPATIONAL PARTICIPATION FOR UNSKILLED RATINGS: 1980 AND 1990

Rating	Number of Personnel 1980	1990
BM	9,185	11,671
BU	2,587	3,027
EO	2,045	2,117
GMG	3,943	4,233
GMM	1,347	2,180
GMT	1,869	0
HT	11,440	7,663
MS	16,805	17,725
SH	4,954	4,704
UT	1,338	1,268
Unskilled Personnel	55,513	54,588
Total Personnel in the Matched Sample	192,848	206,114
% of the Matched Sample that is Unskilled	28.8%	26.5%

Source: Derived from data provided by DMDC.

APPENDIX E. TRENDS IN CIVILIAN OCCUPATIONAL PARTICIPATION

TABLE E.1. CIVILIAN OCCUPATIONAL PARTICIPATION BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990

Occupational Category sample)	Number of Workers (numbers in parenthesis indicate percentage of the total matched		
	1980	1985	1990
Technical Level			
Highly Technical	68 (3.0)	81 (6.3)	77 (6.6)
Technical	1950 (84.2)	1055 (81.7)	944 (80.9)
Semi-Technical	297 (12.8)	155 (12.0)	146 (12.5)
Skill Level			
Skilled	369 (15.9)	207 (16.0)	184 (15.8)
Semi-Skilled	853 (36.9)	504 (39.1)	470 (40.2)
Unskilled	1093 (47.2)	580 (44.9)	513 (44.0)
Total Matched Sample	2315 (100.0)	1291 (100.0)	1167 (100.0)
All Civilian Occupations	5841	4427	4255
Percent of All Civilian Occupations That Were Matched	39.6	29.2	27.4

Source: Derived from data included in the CPS.

TABLE E.2. PERCENTAGE CHANGES IN CIVILIAN OCCUPATIONAL PARTICIPATION BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990

Occupational Category	Percentage Change Between Samples		
	'80-'85	'85-'90	'80-'90
Technical Level			
Highly Technical	+110.0	+5.2	+120.0
Technical	-3.0	-1.0	-4.0
Semi-Technical	-6.7	+4.2	-2.5
Skill Level			
Skilled	+0.6	-1.7	-0.6
Semi-Skilled	+6.0	+3.2	+8.9
Unskilled	-4.9	-2.2	-6.8

Source: Derived from data included in the CPS.

APPENDIX F. TRENDS IN OCCUPATIONAL EARNINGS

TABLE F.1.A. WEEKLY CIVILIAN OCCUPATIONAL EARNINGS BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990 (IN DOLLARS)

Occupational Category	Weekly Earnings		
	1980	1985	1990
Technical Level			
Highly Technical	286.89	376.16	491.87
Technical	292.99	382.94	453.28
Semi-Technical	278.15	339.06	435.95
Skill Level			
Skilled	301.71	384.31	483.57
Semi-Skilled	300.69	392.37	455.13
Unskilled	278.97	361.58	441.59
Total Matched Sample	290.91	377.25	453.66
All Civilian Occupations	279.94	371.00	438.22

Source: Derived from data included in the CPS.

TABLE F.1.B. PERCENTAGE CHANGE IN WEEKLY CIVILIAN OCCUPATIONAL EARNINGS BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990

Occupational Category	Percentage Change in Weekly Earnings		
	'80-'85	'85-'90	'80-'90
Technical Level			
Highly Technical	31.1	30.8	71.4
Technical	30.7	18.4	54.7
Semi-Technical	21.9	28.6	56.7
Skill Level			
Skilled	27.4	25.8	60.3
Semi-Skilled	30.5	16.0	51.4
Unskilled	29.6	22.1	58.3
Total Matched Sample	29.7	20.3	55.9
All Civilian Occupations	32.5	18.1	56.5

Source: Derived from data included in the CPS.

TABLE F.2.A. HOURLY CIVILIAN OCCUPATIONAL WAGES BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990 (IN DOLLARS)

Occupational Category	Hourly Wages		
	1980	1985	1990
Technical Level			
Highly Technical	6.70	8.88	11.34
Technical	6.82	8.94	10.46
Semi-Technical	6.64	7.99	10.24
Skill Level			
Skilled	6.97	9.07	11.16
Semi-Skilled	7.02	9.21	10.60
Unskilled	6.54	8.39	10.15
Total Matched Sample	6.79	8.82	10.49
All Civilian Occupations	6.47	8.62	10.07

Source: Derived from data included in the CPS.

TABLE F.2.B. PERCENTAGE CHANGE IN HOURLY CIVILIAN OCCUPATIONAL WAGES BY TECHNICAL AND SKILL LEVEL: 1980, 1985, AND 1990

Occupational Category	Percentage Change in Hourly Wages		
	'80-'85	'85-'90	'80-'90
Technical Level			
Highly Technical	32.5	27.7	69.3
Technical	31.1	17.0	53.4
Semi-Technical	20.3	28.2	54.2
Skill Level			
Skilled	30.1	23.0	60.1
Semi-Skilled	31.2	15.1	51.0
Unskilled	28.3	21.0	55.2
Total Matched Sample	29.9	18.9	54.4
All Civilian Occupations	33.2	16.8	55.6

Source: Derived from data included in the CPS.

APPENDIX G. NAVY SRB MULTIPLES

TABLE G.1.A. AVERAGE SRB MULTIPLES FOR HIGHLY TECHNICAL RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
AQ	6.0	5.0	0.0	1.0	0.5	0.0
ET	6.0	6.0	2.0	3.0	2.0	1.0
DS	6.0	6.0	4.0	2.5	1.5	1.0
AT	3.0	2.0	0.0	1.0	0.5	0.0
MT	4.0	5.0	0.0	0.0	0.0	0.0
STG	3.0	4.0	0.0	2.0	1.0	0.0
STS	4.0	4.0	0.0	2.5	3.5	1.5
FTB	4.0	5.0	0.0	0.0	0.0	0.0
FTG	0.0	0.0	0.0	3.0	2.5	2.0
Highly Technical Average	4.35	4.25	0.95	2.10	1.46	0.62

Source: Derived from data provided by DMDC and PERS-20F.

TABLE G.1.B. AVERAGE SRB MULTIPLES FOR TECHNICAL RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
AME	0.0	0.0	0.0	0.5	0.0	0.0
UT	0.0	1.0	0.0	0.5	0.5	0.0
EM	4.0	4.0	0.0	3.5	2.0	0.0
CE	2.0	1.0	0.0	0.0	0.0	0.0
IC	1.0	2.0	1.0	1.5	0.5	0.5
IM	1.0	0.0	0.0	3.0	0.5	0.0
AD	2.0	2.0	0.0	0.0	0.0	0.0
AF	0.0	0.0	0.0	0.0	0.0	0.0
CM	0.0	2.0	0.0	0.5	1.0	0.0
AS	0.0	0.0	0.0	0.5	0.0	0.0
ASE	0.0	0.0	0.0	---	---	---
ASM	0.0	0.0	0.0	---	---	---
EO	2.0	1.0	0.0	0.0	0.0	0.0
SW	1.0	1.0	0.0	0.0	0.0	0.0
BU	2.0	1.0	0.0	0.0	0.0	0.0
AV	0.0	0.0	0.0	0.0	0.0	0.0
OT	0.0	0.0	0.0	---	---	---
OTA	---	---	---	1.0	0.5	0.0
OTM	---	---	---	0.5	0.5	0.0
GMG	0.0	0.0	0.0	1.0	0.0	0.0
GMM	2.0	4.0	3.0	1.0	0.5	0.0
GMT	4.0	6.0	2.0	---	---	---
MN	0.0	0.0	0.0	0.0	0.0	0.0
TM	4.0	6.0	2.0	1.0	3.0	1.5
MM	1.0	1.0	1.0	2.0	2.0	1.0
EN	0.0	1.0	0.0	3.0	1.5	0.5
Technical Average	1.55	1.83	0.50	1.67	1.24	0.43

Source: Derived from data provided by DMDC and PERS-20F.

TABLE G.1.C. AVERAGE SRB MULTIPLES FOR SEMI-TECHNICAL RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
SH	0.0	0.0	0.0	0.0	0.0	0.0
HT	1.0	2.0	1.0	2.5	1.5	0.5
LI	0.0	0.0	0.0	0.0	0.0	0.0
ABE	2.0	3.0	2.0	0.0	0.0	0.0
BM	0.0	0.0	0.0	0.0	0.0	0.0
BT	6.0	6.0	2.0	2.5	2.0	1.0
MS	3.0	2.0	0.0	0.0	0.0	0.0
Semi-Tech. Average	2.43	2.36	0.69	0.79	0.56	0.24

Source: Derived from data provided by DMDC and PERS-20F.

TABLE G.2.A. AVERAGE SRB MULTIPLES FOR SKILLED RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
AQ	6.0	5.0	0.0	1.0	0.5	0.0
AT	3.0	2.0	0.0	1.0	0.5	0.0
AV	0.0	0.0	0.0	0.0	0.0	0.0
BT	6.0	6.0	2.0	2.5	2.0	1.0
DS	6.0	6.0	4.0	2.5	1.5	1.0
ET	6.0	6.0	2.0	3.0	2.0	1.0
FTB	4.0	5.0	0.0	0.0	0.0	0.0
FTG	0.0	0.0	0.0	3.0	2.5	2.0
MT	4.0	5.0	0.0	0.0	0.0	0.0
OT	0.0	0.0	0.0	---	---	---
OTA	---	---	---	1.0	0.5	0.0
OTM	---	---	---	0.5	0.5	0.0
STG	3.0	4.0	0.0	2.0	1.0	0.0
STS	4.0	4.0	0.0	2.5	3.5	1.5
SW	1.0	1.0	0.0	0.0	0.0	0.0
Skilled Average	4.51	4.43	1.12	2.08	1.48	0.65

Source: Derived from data provided by DMDC and PERS-20F.

TABLE G.2.B. AVERAGE SRB MULTIPLES FOR SEMI-SKILLED RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
ABE	2.0	3.0	2.0	0.0	0.0	0.0
AD	2.0	2.0	0.0	0.0	0.0	0.0
AF	0.0	0.0	0.0	0.0	0.0	0.0
AME	0.0	0.0	0.0	0.5	0.0	0.0
AS	0.0	0.0	0.0	0.5	0.0	0.0
ASE	0.0	0.0	0.0	---	---	---
ASM	0.0	0.0	0.0	---	---	---
CE	2.0	1.0	0.0	0.0	0.0	0.0
CM	0.0	2.0	0.0	0.5	1.0	0.0
EM	4.0	4.0	0.0	3.5	2.0	0.0
EN	0.0	1.0	0.0	3.0	1.5	0.5
IC	1.0	2.0	1.0	1.5	0.5	0.5
IM	1.0	0.0	0.0	3.0	0.5	0.0
LI	0.0	0.0	0.0	0.0	0.0	0.0
MM	1.0	1.0	1.0	2.0	2.0	1.0
MN	0.0	0.0	0.0	0.0	0.0	0.0
TM	4.0	6.0	2.0	1.0	3.0	1.5
Semi-Skilled Average	1.60	1.92	0.53	1.82	1.39	0.50

Source: Derived from data provided by DMDC and PERS-20F.

TABLE G.2.C. AVERAGE SRB MULTIPLES FOR UNSKILLED RATINGS BY REENLISTMENT ZONE: 1980 AND 1990

	1980			1990		
	Zone			Zone		
Rating	A	B	C	A	B	C
BM	0.0	0.0	0.0	0.0	0.0	0.0
BU	2.0	1.0	0.0	0.0	0.0	0.0
EO	2.0	1.0	0.0	0.0	0.0	0.0
GMG	0.0	0.0	0.0	1.0	0.0	0.0
GMM	2.0	4.0	3.0	1.0	0.5	0.0
GMT	4.0	6.0	2.0	---	---	---
HT	1.0	2.0	1.0	2.5	1.5	0.5
MS	3.0	2.0	0.0	0.0	0.0	0.0
SH	0.0	0.0	0.0	0.0	0.0	0.0
UT	0.0	1.0	0.0	0.5	0.5	0.0
Unskilled Average	1.46	1.42	0.35	0.48	0.24	0.07

Source: Derived from data provided by DMDC and PERS-20F.

APPENDIX H. NAVY REENLISTMENT RATES

TABLE H.1.A. AVERAGE REENLISTMENT RATES FOR HIGHLY TECHNICAL RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
AQ	47.3	52.7	80.6	50.5	68.8	90.6
ET	50.8	52.9	85.7	56.1	61.9	88.6
DS	55.4	51.7	90.9	50.5	56.3	90.7
AT	47.8	31.7	88.9	53.2	66.1	92.0
MT	64.6	80.0	90.4	74.0	75.3	94.5
STG	39.4	55.9	88.4	56.4	75.3	86.1
STS	59.4	65.3	92.9	74.5	89.9	91.7
FTB	50.0	75.6	73.3	78.3	84.6	98.2
FTG	32.1	47.1	89.9	86.3	90.0	92.1
Highly Technical Average	48.9	50.7	87.4	58.2	68.4	90.0
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

TABLE H.1.B. AVERAGE REENLISTMENT RATES FOR TECHNICAL RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
AME	26.9	50.5	93.9	60.8	70.5	95.2
UT	50.0	71.6	96.0	56.4	67.1	92.9
EM	29.9	51.9	87.1	48.7	63.3	93.2
CE	52.9	66.2	89.2	66.9	73.4	94.1
IC	29.6	37.5	84.3	46.5	70.5	91.1
IM	25.6	45.9	95.7	30.4	71.1	90.2
AD	26.2	55.4	93.1	49.8	67.6	93.5
AF	0.0	0.0	100.0	0.0	100.0	100.0
CM	36.7	72.7	91.2	61.2	69.9	95.1
AS	66.7	80.0	93.8	51.3	75.8	95.0
ASE	34.3	40.6	0.0	---	---	---
ASM	27.6	52.0	75.0	---	---	---
EO	57.6	82.0	91.6	58.9	73.1	93.2
SW	39.5	67.6	84.1	65.6	67.4	91.9
BU	49.6	70.2	88.5	59.2	79.1	95.2
AV	0.0	100.0	100.0	100.0	0.0	100.0
OT	29.6	40.9	91.5	0.0	0.0	100.0
OTA	---	---	---	56.5	70.4	88.3
OTM	---	---	---	81.2	65.0	100.0
GMG	15.6	59.3	91.1	41.7	76.0	92.7
GMM	24.1	42.9	92.9	39.9	67.8	86.8
GMT	30.1	54.8	88.7	---	---	---
MN	35.8	68.8	100.0	65.5	71.4	93.0
TM	33.5	62.8	98.7	41.9	78.0	95.8
MM	35.0	48.0	75.4	49.1	66.7	94.7
EN	22.7	90.8	95.2	47.5	91.2	92.9
Tech. Average	31.5	56.9	86.4	49.8	70.4	93.6
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

TABLE H.1.C. AVERAGE REENLISTMENT RATES FOR SEMI-TECHNICAL RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
SH	26.1	68.7	96.3	42.5	82.3	96.3
HT	14.5	52.6	89.7	42.4	79.3	94.2
LI	100.0	56.3	90.9	43.5	91.3	86.8
ABE	22.5	35.0	100.0	39.5	70.0	91.5
BM	20.8	58.7	90.7	38.6	81.4	95.2
BT	26.9	67.3	89.8	43.1	71.1	92.5
MS	42.5	80.6	96.1	65.4	83.0	95.2
Semi-Technical Average	28.4	65.9	92.7	49.1	79.5	94.4
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

TABLE H.2.A. AVERAGE REENLISTMENT RATES FOR SKILLED RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
AQ	47.3	52.7	80.6	50.5	68.8	90.6
AT	47.8	31.7	88.9	53.2	66.1	92.0
AV	0.0	100.0	100.0	100.0	0.0	100.0
BT	26.9	67.3	89.8	43.1	71.1	92.5
DS	55.4	51.7	90.9	50.5	56.3	90.7
ET	50.8	52.9	85.7	56.1	61.9	88.6
FTB	50.0	75.6	73.3	78.3	84.6	98.2
FTG	32.1	47.1	89.9	86.3	90.0	92.1
MT	64.6	80.0	90.4	74.0	75.3	94.5
OT	29.6	40.9	91.5	0.0	0.0	100.0
OTA	---	---	---	56.5	70.4	88.3
OTM	---	---	---	81.2	65.0	100.0
STG	39.4	55.9	88.4	56.4	75.3	86.1
STS	59.4	65.3	92.9	74.5	89.9	91.7
SW	39.5	67.6	84.1	65.6	67.4	91.9
Skilled Average	43.7	54.3	88.0	56.4	68.4	90.5
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

TABLE H.2.B. AVERAGE REENLISTMENT RATES FOR SEMI-SKILLED RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
ABE	22.5	35.0	100.0	39.5	70.0	91.5
AD	26.2	55.4	93.1	49.8	67.6	93.5
AF	0.0	0.0	100.0	0.0	100.0	100.0
AME	26.9	50.5	93.9	60.8	70.5	95.2
AS	66.7	80.0	93.8	51.3	75.8	95.0
ASE	34.3	40.6	0.0	---	---	---
ASM	27.6	52.0	75.0	---	---	---
CE	52.9	66.2	89.2	66.9	73.4	94.1
CM	36.7	72.7	91.2	61.2	69.9	95.1
EM	29.9	51.9	87.1	48.7	63.3	93.2
EN	22.7	90.8	95.2	47.5	91.2	92.9
IC	29.6	37.5	84.3	46.5	70.5	91.1
IM	25.6	45.9	95.7	30.4	71.1	90.2
LI	100.0	56.3	90.9	43.5	91.3	86.8
MM	35.0	48.0	75.4	49.1	66.7	94.7
MN	35.8	68.8	100.0	65.5	71.4	93.0
TM	33.5	62.8	98.7	41.9	78.0	95.8
Semi-Skilled Average	31.1	55.2	85.8	48.8	70.3	93.8
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

TABLE H.2.C. AVERAGE REENLISTMENT RATES FOR UNSKILLED RATINGS BY REENLISTMENT TERM: 1980 AND 1990

	1980			1990		
	Term			Term		
Rating	1st	2nd	3rd+	1st	2nd	3rd+
BM	20.8	58.7	90.7	38.6	81.4	95.2
BU	49.6	70.2	88.5	59.2	79.1	95.2
EO	57.6	82.0	91.6	58.9	73.1	93.2
GMG	15.6	59.3	91.1	41.7	76.0	92.7
GMM	24.1	42.9	92.9	39.9	67.8	86.8
GMT	30.1	54.8	88.7	---	---	---
HT	14.5	52.6	89.7	42.4	79.3	94.2
MS	42.5	80.6	96.1	65.4	83.0	95.2
SH	26.1	68.7	96.3	42.5	82.3	96.3
UT	50.0	71.6	96.0	56.4	67.1	92.9
Unskill Average	30.0	66.2	92.7	50.8	80.0	94.5
Navy Average	31.4	57.5	91.6	51.6	74.1	93.4
Average for all SRB Rates	32.1	52.2	88.2	52.7	72.1	92.1
Average for non-SRB Rates	31.2	61.4	93.9	49.0	74.5	94.0

Source: Derived from data provided by DMDC and PERS-20F.

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